



# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII  
901 NORTH 5TH STREET  
KANSAS CITY, KANSAS 66101

**JUL 27 2007**

Mr. Edward Galbraith, Director  
Water Pollution Control Program  
Water Protection and Soil Conservation Division  
Missouri Department of Natural Resources  
P.O. Box 176  
Jefferson City, Missouri 65102

Dear Mr. Galbraith:

RE: Permit Limits in Lieu of a TMDL for Gabriel Creek (WBID 883)

This letter responds to the submission from the Missouri Department of Natural Resources (MDNR) dated April 24, 2007, regarding Gabriel Creek. Gabriel Creek was listed as impaired on Missouri's 1998 §303(d) list for Biochemical Oxygen Demand (BOD) and Non Filterable Residue (NFR). MDNR proposes to correct the impairments with National Pollutant Discharge Elimination System (NPDES) permit limits in lieu of Total Maximum Daily Loads (TMDLs). The following water body segment is proposed to be corrected through permit limits:

Water Body	WBID	Impairment	Source	Permit #	Year added to list
Gabriel Creek	883	Biochemical Oxygen Demand (BOD) Non Filterable Residue (NFR)	Stover's southwest and northwest waste water lagoons	MO-0047058 MO-0047040	1998

Waters require TMDLs when certain pollution control requirements are not stringent enough to implement water quality standards (WQS) for such waters. To exempt an impaired water from the TMDL process, the pollution control requirements cited in the regulation under 40 CFR §130.7(b)(1)(i), (ii), and (iii) must be established and enforced by federal, state, or local laws or regulations, and be stringent enough that, when applied, the receiving water will meet WQS.

In regards to Gabriel Creek, Federal regulations at 40 CFR §130.7(b)(1)(ii) provide that where [more stringent effluent limitations (including prohibitions) required by either state or local authority preserved by section 510 of the Act, or Federal authority (law, regulation, or treaty)] are stringent enough to implement WQS, a TMDL is not required. The Environmental Protection Agency (EPA) Region 7 has completed its review of this submission, and other previously submitted information supporting this permit in lieu of a TMDL, and concur that a

TMDL is not required for this impaired water body because the impairments are being addressed through more stringent NPDES permit limits as per 40 CFR 130.7(b)(ii).

The Stover waste water lagoons have been identified as the sole sources for the BOD and NFR impairments on Gabriel Creek as a result of surface water monitoring directly above and below the lagoons. NPDES permits for both lagoons were issued on April 13, 2007. Both permits include a compliance schedule to commence by April 13, 2007. Final limits, which will achieve WQS for BOD and NFR, will be imposed through the April 13, 2007, permits with the conclusion of the compliance schedule by April 13, 2010. In review of the southwest lagoon permit, the existing effluent limits have been reduced from 65/45 weekly/monthly average BOD and TSS to 25/13. The permit also includes the addition of permit limits for ammonia. Additionally, the permit requests instream monitoring of dissolved oxygen, temperature, pH, and ammonia, ensuring limits are appropriate. The permit also includes a reopener clause to allow for stricter limits if monitoring shows WQS violations. The northwest lagoon's discharge to Gabriel Creek will be eliminated by April 13, 2011, and the facility closed by April 12, 2012. At that time, effluent will only be discharged through the upgraded southwest lagoon.

Enclosed with this letter is the Region 7 4b Rationale Document which summarizes EPA's approval of the permit in lieu of (PIL) a TMDL. EPA believes the separate elements of the PIL described in the enclosed form adequately address the pollutant of concern.

If you have any questions or concerns in regards to this matter, please do not hesitate to contact Tabatha Adkins, of my staff, at (913)551-7128.

Sincerely,



William A. Spratlin

Director

Water, Wetlands and Pesticides Division

Enclosure

cc: John Hoke  
Missouri Department of Natural Resources

Phil Schroeder  
Missouri Department of Natural Resources



## EPA Region 7 4b Rationale

**Water body ID(s):** MO\_0833  
**Water body Name(s):** Gabriel Creek  
**Pollutant(s):** Biochemical Oxygen Demand (BOD) and Non-Filterable Residue (NFR)  
**State:** MO **HUC(s):** 10300103  
**Basin:**  
**Submittal Date:** April 24, 2007  
**Concurred:** July 12, 2007  
**First listing cycle:** 1998 MO 303(d) list also listed on 2002 MO 303(d) list

### Submittal Letter

*State submittal letter indicates final Maximum Daily Load(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act. Include date submitted letter was received by EPA and date of receipt of any revisions.*

EPA received this submittal with cover letter, final permits, and fact sheets on April 24, 2007.

### Concern

*A statement of the problem causing the impairment.*

The sole source of the impairments is Stover's Southwest Lagoon and Northwest Lagoon (permit numbers MO-0047058 and MO-0047040). The lagoons discharge near the headwaters of Gabriel Creek. The upstream flow is low (zero to 0.01 cubic feet/second). The effluent contribution to the stream ranges from 10-80 times that of the stream. There have been observed violations of the narrative standard for Non-Filterable Residue (NFR).

### Implementation Strategy

*A description of the proposed implementation strategy and supporting pollution controls necessary to achieve WQS, including the identification of point and nonpoint source loadings that when implemented assure the attainment of all applicable WQS.*

Both permits were reissued on April 13, 2007. The previous permits had weekly and monthly average limits for BOD of 65 mg/L and 45 mg/L and for TSS 120 mg/L and 80 mg/L, respectively. A wasteload allocation (WLA) study was conducted. A BOD of 25 mg/L was the result. The WLA for BOD was set at 25 pounds/day (lbs/d) for the Southwest plant and 15.2 lbs/d for the Northwest plant. The WLA for TSS was set for both plants at 25 lbs/d. The WLA for ammonia was set seasonally (May 1- October 31, November 1 – April 30) at 2.0/3.5 lbs/d for the Southwest plant and 1.2/2.1 lbs/d for the Northwest plant. These WLAs will ensure the water quality standards (WQS) for dissolved oxygen (DO) of 5 mg/L and the narrative standards for NFR will be met.

### Time

*An estimate or projection of the time when WQS will be met.*

April 13, 2012, when the Southwest Lagoon meets the new limits and the Northwest Lagoon ceases discharging, WQS should be achieved in Gabriel Creek.

**Schedule**

*A reasonable schedule for implementing the necessary pollution controls.*

Both permits were issued April 13, 2007. The Southwest Lagoon limits have been reduced and will require a treatment plant upgrade to achieve the necessary permit limits. The final effluent limits will become final three years from the date of permit issuance (April 13, 2010). The Northwest Lagoon retains the previous limits. It also includes a compliance schedule for the city to cease discharges and close the plant within four years of the date of permit issuance (April 13, 2011) and eliminate the lagoon within five years (April 12, 2012).

**Monitoring**

*A description of, and schedule for, monitoring milestones for tracking and reporting progress to EPA on the implementation of the pollution controls.*

Ambient stream monitoring by MDNR will be scheduled after the new limits go into effect, to determine if the impairment has been eliminated. The permit includes quarterly instream monitoring 100 yards downstream of the outfall, for DO, temperature, pH, and ammonia, to ensure permit limits are being achieved.

**Commitment to Revise**

*A commitment to revise, as necessary, the implementation strategy and pollution controls if progress towards meeting WQS is not being shown.*

A reopener clause has been included in both permits if monitoring shows violations of WQS.

\*\*\*\*\**Pollution control requirements in the submittal*\*\*\*\*\*

National Pollution Discharge and Elimination System (NPDES)

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION



## MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No.	MO-0047058
Owner:	City of Stover
Address:	P.O. Box 370, Stover, MO 65078
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Stover Southwest Lagoon
Address:	West of Vine Street, Stover, MO 65078
Legal Description:	NW ¼, NE ¼, Sec. 3, T42N, R19W, Morgan County
Latitude/Longitude:	+3826148/-09259597
Receiving Stream:	Gabriel Creek (C) 303(d)
First Classified Stream and ID:	Gabriel Creek (C)(0883)
USGS Basin & Sub-watershed No.:	(10300103 - 020002)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

### FACILITY DESCRIPTION

#### Outfall #001 – POTW – SIC #4952

Two cell aerated lagoon/sludge is retained in the lagoon or land applied  
Design population equivalent is 1,200.  
Design flow is 120,000 gallons per day.  
Actual flow is 39,600 gallons per day.  
Design sludge production is 8.5 dry tons/year.

Continued Next Page

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

April 13, 2007

Effective Date

April 12, 2012

Expiration Date

MO 780-0041 (10-93)

Doyle Childers, Director, Department of Natural Resources  
Executive Secretary, Clean Water Commission

Edward Galbraith, Director of Staff, Clean Water Commission

FACILITY DESCRIPTION (continued)

Outfall #S1 – Instream Monitoring

100 yards downstream of Outfall 001

See Table A. and section D. Instream Monitoring Conditioning for instructions.

Legal Description: NW ¼, NE ¼, Sec. 3, T42N, R19W, Morgan County

Latitude/Longitude: +3826169/-09300022

First Classified Stream and ID: Gabriel Creek (C)(0883)

USGS Basin & Sub-watershed No.: (10300103 - 020002)

<b>A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS</b>					PAGE NUMBER 3 of 9	
					PERMIT NUMBER MO-0047058	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective upon issuance and remain in effect until three (3) years from the date of issuance of this permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/month	24 hr. total
Biochemical Oxygen Demand <sub>5</sub> ***	mg/L		65	45	once/month	24 hr. composite
Total Suspended Solids***	mg/L		120	80	once/month	24 hr. composite
pH – Units	SU	****		****	once/month	grab
Temperature	mg/L	*		*	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab
Ammonia as N	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>May 28, 2007</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions			once/year in August	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>October 28, 2007</u> .						
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective three (3) years after the date of issuance of this permit and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/month	24 hr. total
Biochemical Oxygen Demand <sub>5</sub> (Note 1)	mg/L	25		13	once/month	24 hr. composite
Total Suspended Solids (Note 1)	mg/L	25		13	once/month	24 hr. composite
pH – Units (Note 1)	SU	*****		*****	once/month	grab
Temperature	mg/L	*		*	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab
Ammonia as N	mg/L				once/month	grab
(May 1 – Oct 31)		3.7		1.9		
(Nov 1 – April 30)		7.5		3.7		
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>May 28, 2010</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions			once/year in August	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>October 28, 2010</u> .						
<b>B. STANDARD CONDITIONS</b>						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I &amp; III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

<b>A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS</b>					PAGE NUMBER 4 of 9	
					PERMIT NUMBER MO-0047058	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #S1</u>						
Dissolved Oxygen	mg/L	*		*	once/quarter**	grab
Temperature	mg/L	*		*	once/quarter **	grab
pH	SU	*		*	once/quarter**	grab
Ammonia as N	mg/L	*		*	once/quarter**	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>October 28, 2007</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
<b>B. STANDARD CONDITIONS</b>						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I &amp; III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

MO 780-0010 (8/91)

**A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS** (continued)

- \* Monitoring requirement only.
- \*\* Sample once per quarter during the months of March, June, August, and October.
- \*\*\* This facility is required to meet a removal efficiency of 65% or more.
- \*\*\*\* pH is measured in pH units and is not to be averaged. The pH is to be maintained at or above 6.0 pH units.
- \*\*\*\*\* pH is measured in pH units and is not to be averaged. The pH is to be maintained in the range of 6.0-9.0 pH units.

Note 1 – After upgrades, this facility will be required to meet a removal efficiency of 85% or more, and a pH of 6.0-9.0.

**C. SPECIAL CONDITIONS**

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
  - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
    - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
    - (2) controls any pollutant not limited in the permit.
  - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
  - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
2. All outfalls must be clearly marked in the field.
3. The permittee shall develop and implement a program for maintenance and repair of the collection system. The suggested guidance is the US EPA's Guide For Evaluating Capacity, Management, Operation, And Maintenance (CMOM) Programs At Sanitary Sewer Collection Systems (Document number EPA 305-B-05-002). The permittee shall submit a report semi-annually in April and October with the Discharge and Monitoring reports which address measures taken to locate and eliminate sources of infiltration and inflow into the City's collection system.



C. SPECIAL CONDITIONS (continued)

4. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.

5. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
  - (1) One hundred micrograms per liter (100 µg/L);
  - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
  - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
  - (4) The level established in Part A of the permit by the Director.
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
- (c) That the effluent limit established in part A of the permit will be exceeded.

6. Report as no-discharge when a discharge does not occur during the report period.

7. Water Quality Standards

- (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
- (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
  - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
  - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
  - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
  - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
  - (5) There shall be no significant human health hazard from incidental contact with the water;
  - (6) There shall be no acute toxicity to livestock or wildlife watering;
  - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
  - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

8. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities

- (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
- (b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. Permittee shall notify the department at least 180 days prior to the planned removal of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

C. SPECIAL CONDITIONS (continued)

9. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	once/year	24 hr. composite	August

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a SINGLE-dilution test in the months and at the frequency specified above. For tests which are successfully passed, submit test results USING THE DEPARTMENT'S WET TEST REPORT FORM #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
  - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
  - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
  - (c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
  - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
  - (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
  - (f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
  - (g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
  - (h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
  - (i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
  - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
  - (k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
  - (l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
  - (m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (3) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days and biweekly thereafter, until one of the following conditions are met:
  - (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
  - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (4) Failure of at least two multiple-dilution tests during any period of accelerated monitoring violates the permit narrative requirement for aquatic life protection.

C. SPECIAL CONDITIONS (continued)

9. Whole Effluent Toxicity tests (continued):

- (5) The permittee shall submit a CONCISE summary of all test results for the test series to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (9) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.
- (10) Submit a concise summary in tabular format of all test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

- (1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level;  $p = 0.05$ ) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level;  $p = 0.05$ ) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other Federal guidelines as appropriate or required.
- (2) To pass a multiple-dilution test:
  - (a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC), OF 30% OR LESS THE AEC must be less than three-tenths (0.3) of the  $LC_{50}$  concentration for the most sensitive of the test organisms; **OR**,
  - (b) For facilities with an AEC greater than 30% the  $LC_{50}$  concentration must be greater than 100%; **AND**,
  - (c) all effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level;  $p = 0.05$ ) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level;  $p = 0.05$ ) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required. Failure of one multiple-dilution test may be considered an effluent limit violation.

(c) Test Conditions

- (1) Test Type: Acute Static non-renewal
- (2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS.
- (3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.
- (4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

C. SPECIAL CONDITIONS (continued)

9. Whole Effluent Toxicity tests (continued):

- (5) Single-dilution tests will be run with:
  - (a) Effluent at the AEC concentration;
  - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
  - (c) reconstituted water.
- (6) Multiple-dilution tests will be run with:
  - (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
  - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
  - (c) reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

D. INSTREAM MONITORING CONDITIONS

1. Downstream samples should be taken approximately 100 yards downstream of Outfall 001. In the event that a safe, accessible location is not present at this location, a suitable location can be negotiated with the department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface. The upstream receiving water sample should be collected at a point upstream from any influence of the effluent, where the water is visibly flowing down stream.
2. When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream/lake characteristics (e.g., septic conditions, algae growth, etc.), the stream segment (e.g., riffle, pool or run) or the lake depth from where the sample was collected. These observations shall be submitted with the sample results.
3. Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
  - If turbidity in the stream increases notably; or
  - If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours
4. Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling techniques. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.
5. To obtain accurate measurements, D.O., temperature and pH analyses should be performed on-site in the receiving stream where possible. However, due to high flow conditions, access, etc., it may be necessary to collect a sample in a bucket or other container. When this is necessary, care must be taken not to aerate the sample upon collection. If for any reason samples must be collected from an alternate site from the one listed in the permit, the permittee shall report the location with the sample results.
6. Dissolved oxygen measurements are to be taken during the period from one hour prior to sunrise to one and one-half hour after sunrise.
7. Please contact the department if you need additional instructions or assistance.

## SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

### Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$ )
Test acceptability criterion:	90% or greater survival in controls

### Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$ )
Test Acceptability criterion:	90% or greater survival in controls

Date of Fact Sheet: 10-3-06

Date of Public Notice: 10-13-06

## NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FACT SHEET

This Fact Sheet explains the applicable regulations, rationale for development of this permit and the public participation process.

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Permits in Missouri are issued by the Director of the Department of Natural Resources under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended).

NPDES PERMIT NUMBER: MO-0047058

FACILITY NAME: Stover Southwest Lagoon

OWNER NAME: City of Stover

LOCATION: NW ¼, NE ¼, Sec. 3, T42N, R19W, Morgan County

RECEIVING STREAM: Gabriel Creek (C) 303(d)

PURPOSE: Operating permit renewal, Permit-in-lieu-of TMDL

### FACILITY DESCRIPTION AND RATIONALE

The wastewater treatment facility is composed of a two-cell aerated lagoon.

10 CSR 20-7.031 Missouri Water Quality Standards, Missouri Department of Natural Resources (the Department) "defines the Clean Water Commission water quality objectives in terms of water uses to be maintained and the criteria to protect those uses." The receiving stream's beneficial water uses to be maintained are livestock and wildlife watering, and protection of aquatic life. Because of impacts from this facility and the Stover Northwest Lagoon (MO-0047040), the beneficial use of protection of aquatic life is not being attained for one mile below these facilities. This has caused Gabriel Creek to be placed on Missouri's list of impaired waters, the 303(d) list.

To protect these beneficial uses and the water quality of the receiving stream, effluent limitations have been established under federal and state laws. Please see the Water Quality Review Sheet portion of this Fact Sheet for effluent limit derivation. The effluent limits were written based on the combined flow from the two Stover facilities. Wasteload allocation studies conducted by the department indicate that significant upgrades to these facilities will be necessary. Because the two lagoons are in close proximity, the permits are written with the assumption that one facility will be eliminated and all flow will be directed to one new facility. Presently, the permit for the Northwest Lagoon includes a Schedule of Compliance for elimination of the discharge, and the permit for the Southwest Lagoon includes new effluent limits.

The two permits will be submitted to the U.S. Environmental Protection Agency in lieu of a Total Maximum Daily Load (TMDL). This is common practice for the department when it is known that one or more permitted facilities are the source of pollution for an impaired stream.

The permit will be issued for a period of five years.

Waste Load Allocation  
Gabriel Creek  
WBID: 0883

**County:** Morgan  
**Nearby Cities:** Stover  
**Length of impairment:** 1 mile  
**Pollutant:** Biochemical Oxygen Demand (BOD),  
Non volatile suspended solids (NVSS)  
**Source:** Stover Wastewater Treatment Plants (WWTPs)

**Beneficial uses:**

1. Livestock and wildlife watering
2. Protection of warm water aquatic life and protection of human health (associated with) fish consumption.

**Impaired use:** Protection of warm water aquatic life and protection of human health (associated with) fish consumption.

The Gabriel Creek area of interest begins 0.1 miles upstream of Stover Southwest Lagoon and ends 2.0 miles downstream of Stover Northwest Lagoon

**Standards that apply**

- The Missouri Water Quality Standard (10 CSR 20-7.031 Table A) for dissolved oxygen in streams is 5.0 mg/L (as a minimum).
- Standards for Non-Filterable Residue (NFR) may be found in the general criteria section of the WQS, 10 CSR 20-7.031(3)(A) and (C) where it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- Ammonia (NH<sub>3</sub>-N) standards vary depending on the pH, the temperature, and the presence of early life stage of fish. Acute ammonia limit for General Warm Water Fishery (at a pH of 7.8) is 12.1 mg/L. chronic criteria at the same pH and when early life stages are present, are 3.1 at 6 °C and 1.5 mg/L at 26 °C. The ammonia tables are found at 10 CSR 20-7.031 Table B.

**Modeling:**

Parsons (EPA contractor) using stream water quality data setup and calibrated a QUAL2K steady state model. The simulation targeted a DO concentration of at least 5 mg/L at the edge of the mixing zone.

The QUAL2K and its predecessor model QUAL2E (Brown and Barnwell, 1987) permit simulation of several water quality constituents in a branching stream system using a finite difference solution to the one-dimensional advective-dispersive mass transport and reaction equation. The conceptual representation of a stream used in the QUAL2K or QUAL2E formulation is a stream reach that has been divided into a number of sub-reaches or computational elements equivalent to finite differences. For each computational element, a hydrologic balance in terms of flow, a heat balance in terms of temperature, and a mass balance in terms of concentration is written. Both advective and dispersive transport processes are considered in the mass balance. The equations are solved for the steady-flow steady-state condition in a classical implicit backward difference method (Barnwell et al., 2003).

The QUAL2K framework includes a new element for software environment and interface. Q2K is implemented within the Microsoft Windows environment. It is programmed in the Windows macro language with Visual Basic for Applications (VBA). Microsoft Excel is used as the graphical user interface. Furthermore, new enhancements are provided with QUAL2K model:

- Model segmentation. Q2K segments the system into river reaches comprised of equally spaced elements. In contrast, Q2K uses unequally-spaced reaches. In addition, multiple loadings and abstractions can be input into any reach.
- Carbonaceous BOD speciation. Q2K uses two forms of carbonaceous BOD to represent organic carbon. These forms are a slowly oxidizing form (slow CBOD) and a rapidly oxidizing form (fast CBOD). In addition, non-living particulate organic matter (detritus) is simulated. This detrital material is composed of particulate carbon, nitrogen and phosphorus in a fixed stoichiometry.
- Anoxia. Q2K accommodates anoxia by reducing oxidation reactions to zero at low oxygen levels. In addition, denitrification is modeled as a first-order reaction that becomes pronounced at low oxygen concentrations.
- Sediment-water interactions. Sediment-water fluxes of dissolved oxygen and nutrients are simulated internally rather than being prescribed. That is, oxygen, sediment oxygen demand and nutrient fluxes are simulated as a function of settling particulate organic matter, reactions within the sediments, and the concentrations of soluble forms in the overlying waters.
- Bottom algae. The model explicitly simulates attached bottom algae.
- Light extinction. Light extinction is calculated as a function of algae, detritus and inorganic solids.

### Modeling assumptions:

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

where:

TMDL: Total Maximum Daily Load

WLA: Waste Load Allocation (for point sources)

LA: Load Allocation (for non-point sources)

MOS: Margin of Safety (to account for uncertainties in TMDL development)

The waste load allocation scenarios were formulated based on the following conditions:

- 7Q10 flow (the lowest average 7-day flow over 10-year period of time) in the stream
- Permitted facilities are discharging at their design capacities

This step evaluates the ambient water quality response resulting from discharger's currently modeled load (e.g. from flow and allowable effluent limit) against the water quality target. If there is an exceedance, the currently modeled load is reduced to achieve the water quality objective. The waste load allocation is expressed as an allowable effluent limit (or a permitted load) from a point source discharger. The results will be converted into water quality based effluent limits (WQBELS) for permit requirement.

### Results:

Flow (ft <sup>3</sup> /s)	BOD (mg/L)	NH <sub>3</sub> -N (mg/L) *	NO <sub>2</sub> +NO <sub>3</sub> (mg/L)	Org N (mg/L)	Org P (mg/L)	Inorg P (mg/L)	NVSS
0.80	25	2.0 / 3.5	0.02	6.78	0.37	1.40	19

\* Seasonal: (May 1 - Oct. 31) / (Nov. 1 - Apr. 30)